

Editorial

Enhanced Recovery After Surgery Protocols: Yes or No?

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Enhanced Recovery after Surgery (ERAS) is a concept that grew from the work of Henrik Kehlet and others [1] who demonstrated over 30 years ago that very early discharge home was possible after both open and laparoscopic colorectal resections [2]. Following this “fast track” surgery evolved changing its name to “Enhanced Recovery” to emphasize that quality and not speed was the most important principle. Much research has been undertaken to elucidate the key areas of the process. At its heart was minimization of the pathophysiological (or “stress”) response to major surgery. The benefits of ERAS have now been shown not only to reduce length of hospital stay (LOS), but patients also have reduced postoperative complications, reduced cost, and even increased life expectancy in certain oncological populations [2].

With ERAS growing in popularity, but being practised somewhat inconsistently, the ERAS Society was founded to undertake research, education, audit and the implementation of this growing multimodal, multidisciplinary evidence-based practice. One key area of activity was the writing of guidelines and protocols based on the best possible evidence and to date over 25 guidelines have been introduced covering a wide range of elective and emergency surgery. These guidelines have been widely cited and downloaded. The major ERAS elements are summarised in Table 1.

On the face of it, guidelines provide a valuable framework, particularly for units embarking on ERAS. By condensing and assimilating the best available evidence by a body of experts, they help to reduce variation in practice.

So what are the controversies with ERAS protocols?

Firstly, methodology quality needs to be consistent and rigorous, both by asking structured questions, e.g., using PICO methodology (Patient/Population, Intervention, Comparator/Control, and Outcomes), and the certainty of evidence and the strength of recommendations need to be stated, e.g., using the GRADE tool (Grading of Recommendations Assessment, Development, and Evaluation) followed by a consensus based development of recommendations (e.g., Delphi process), with regular review updates. The ERAS Society has published standards in 2020 [3] for guideline development but many guidelines still predate this. A further issue is that, for many areas, good quality evidence may not exist and is merely extrapolated from other similar surgeries. For example, if evidence is not available

for elements of pancreatic surgery, is it reasonable to use the evidence from liver surgery instead? Moreover, much of the early evidence for the protocols came from studies of a single element within a surgical speciality and comparing to “traditional care”. Whilst it may be possible to demonstrate advantages within this unrealistic scenario, when these elements are combined within an ERAS multimodal evidence-based pathway, these benefits may disappear. For example, intraoperative goal-directed fluid therapy (GDFT) benefits patients within a traditional setting (reduced morbidity and LOS) but these differences disappeared within an ERAS setting [4]. Indeed, after the enthusiasm for GDFT since its peak popularity a couple of decades ago for many major surgeries, it has significantly waned, and evidence now suggests its use only for cardiac surgery and hip surgery but not for elective or emergency abdominal surgery [5]. Similar recommendations have been applied to other cornerstones of ERAS protocols for example carbohydrate loading, which may be useful only for mitigating thirst and hunger but with little effect on LOS, pain scores and PONV [6]. A further apparent paradox was highlighted in the most recent colorectal guidelines, where some recommended elements have low evidence but nevertheless have strong recommendations, such as preoperative optimization of comorbidities [7].

Secondly, the protocols often have many elements (in some cases over thirty) and this number often leads to significant problems with implementation. Whilst there is evidence that increasing compliance reduces variation and improves outcomes [8], embracing the concept of aggregation of marginal gains, others have tried to simplify the processes and concentrate on certain elements, effectively delivering “partial ERAS” [9]. Given that it would be very unlikely that all elements are of equal importance, it is natural to try to elucidate and concentrate on those elements which have the greatest impact. These have recently been suggested as minimally invasive procedures, multimodal pain control with limited opioid use and early mobilization which were most associated with decreased LOS and readmission [10]. Moreover, it is difficult to design studies to evaluate the specific role of individual elements and the gold standard randomised controlled trial (RCT) may be better replaced by other methods such as platform trials and cluster RCTs [9].



Table 1. Summary of ERAS elements.

Preoperative	Intraoperative	Postoperative
Preadmission counselling	Short acting anaesthetic drugs	Early removal of urinary catheter/drains and nasogastric tube (if used)
Prehabilitation	Mid-thoracic epidural (open surgery)	Early oral fluids, nutrition and mobilization (DrEaMing)
Preoperative optimisation of comorbidities including anaemia and nutritional status	Prevention of intraoperative hypothermia	Blood glucose management
Alcohol and smoking cessation	Avoidance of salt and water overload	Multimodal opioid sparing analgesia
Fluid and Carbohydrate loading	Minimally invasive/small incision surgery	Management of postoperative nausea and vomiting
No/selective bowel preparation		Stimulation of gastrointestinal motility
Minimum Fasting duration		Follow-up and audit of results
Antibiotic prophylaxis including surgical site preparation		
Thromboprophylaxis		
No pre-anaesthetic medication		

ERAS, Enhanced Recovery after Surgery.

Harnessing IT is key to ERAS guideline success. One area is data collection for ERAS units to elucidate compliance, outcomes and benchmarking yet this is somewhat haphazard. This is not widely adopted, although there are some good commercial databases. Probably the most useful area is a live dashboard which allows units to see their progress and address suboptimal issues without delay. In addition, if protocols were published on a website updates would be much quicker, such as PROSPECT guidelines (procedure specific postoperative pain management), produced by the European Society of Regional Anaesthesia and Pain Therapy (ESRA) [11].

Another issue revolves around what is understood about recovery; ERAS protocols are based around designing clinical pathways that deliver an enhanced recovery, but there is no agreed definition of what this “recovery” looks like. Initially, reduced LOS was a major metric [12] but others have looked at complications, morbidity, mortality and aspects of survival (e.g., long term, cancer free or five-year survival, days at home up to 30 days after surgery). Yet whilst these medical perspectives are used as a benchmark, they ignore an important, wider outcome measure: the patient’s perspective. These include not only resolution of preoperative symptoms but functional assessment, with a return to normal physical, psychological, and social well-being and the ability to undertake prior daily activities. There are several metrics used including Patient-Reported Outcome Measures (PROMs), Patient-Reported Experience Measures (PREMs) and Quality of Recovery (QoR) scores [13]. Moreover, patient groups should be included in the protocols, and this is not yet the case.

A common issue is the “knowing-doing gap”: whereby even with excellent protocols, and high-grade evidence, this evidenced based knowledge is not translated into effective implementation. There are many reasons for

this, including resistance to embracing new ideas and inadequate resources (including staff, education, equipment). Protocols are ultimately useless unless there is now an understanding of implementation science and incorporation of implementation strategies into the guidelines themselves [14].

A final issue concerns financial conflicts of interest (FCOI), with up to a third of these undisclosed in various clinical practice guidelines [15]. For example, how reliable are recommendations for equipment (e.g., haemodynamic monitoring) or medication (e.g., carbohydrate drinks) when one of the authors has a FCOI?

Perhaps a rethink of current protocols is necessary. Many of the elements are now simply standards of care, including preoperative optimization, anaemia, counselling, minimally invasive surgery, avoidance of hypothermia, eu-volaemia, antibiotics, etc. This would then allow for focus to be directed towards areas where delivery of care is more variable and improvement is required—especially on the often overlooked areas of postoperative care (ileus prevention, IV cannula and drain removal), all facilitating early drinking, eating and mobilisation (DrEaMing), a key metric which may be a very useful measurement of overall ERAS success [16]. Large RCTs are impractical and costly, and different ways of gathering data need to be explored. IT needs to be harnessed to allow contemporaneous data to be collected and analysed. Finally, and most importantly, without a unified definition of recovery, enhancing recovery remains a rather illogical concept.

Key Points

- Enhanced Recovery after Surgery (ERAS) presents a paradigm shift in the delivery of major elective and emergency surgery.

- Reduced lengths of hospital stay are possible, alongside reductions in cost, complications and increased life expectancy.

- ERAS depends on adherence to a multistep evidence-based pathway elements within protocols.

- However, the evidence quality supporting the protocols needs to be patient- and pathway-specific and of the highest quality.

- Protocols have too many elements many of which are now regarded as standards of care.

- Future work needs to identify the most important areas for high-quality research, contemporaneous data collection and postoperative clinical focus.

Availability of Data and Materials

Not applicable.

Author Contributions

All elements of the study and subsequent write-up were carried out by the author [WF]. The author read and approved the final manuscript. The author has participated sufficiently in the work and agreed to be accountable for all aspects of the work.

Ethics Approval and Consent to Participate

Not applicable.

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Conflicts of Interest

William Fawcett was on the Executive Committee of the World ERAS committee until 2025.

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